

E1068.0

PCT

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
14 July 2005 (14.07.2005)

PCT

(10) International Publication Number  
**WO 2005/063621 A1**

(51) International Patent Classification<sup>7</sup>: **C01B 33/00**,  
C30B 13/00, 15/00

Kristiansand (NO). TRONSTAD, Ragnar [NO/NO];  
Søvigneset 45, N-4640 Søgne (NO). ZAHEDI, Cyrus  
[NO/NO]; Solbergelva 42F, N-1337 Sandvika (NO).  
DETHLOFF, Christian [NO/NO]; Birgitte Hammersvei  
14B, N-1167 Oslo (NO).

(21) International Application Number:  
**PCT/NO2004/000003**

(74) Agent: VINDENES, Magne; c/o Elkem ASA Patent Department, P.O. Box 8040 Vågsbygd, N-4675 Kristiansand (NO).

(22) International Filing Date: 12 January 2004 (12.01.2004)

(25) Filing Language: English

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

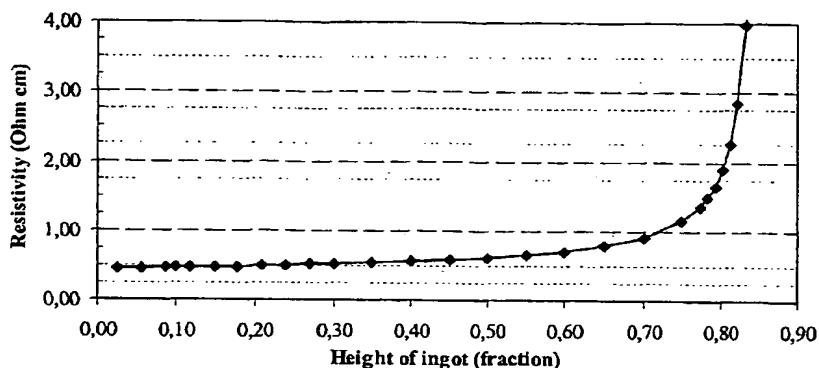
(26) Publication Language: English

(30) Priority Data:  
20035830 29 December 2003 (29.12.2003) NO

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

*[Continued on next page]*

(54) Title: SILICON FEEDSTOCK FOR SOLAR CELLS



**WO 2005/063621 A1**

(57) Abstract: The present invention relates to silicon feedstock for producing directionally solidified silicon ingots, thin sheets and ribbons for the production of silicon wafers for PV solar cells where the silicon feedstock contains between 0.2 and 10 ppm boron and between 0.1 and 10 ppm phosphorus distributed in the material. The invention further relates to directionally solidified silicon ingot or thin silicon sheet or ribbon for making wafers for solar cells containing between 0.2 ppm and 10 ppm boron and between 0.1 ppm and 10 ppm phosphorus distributed in the ingot, said silicon ingot having a type change from p-type to n-type or from n-type to p-type at a position between 40 and 99 % of the ingot height or sheet or ribbon thickness and having a resistivity profile described by an exponential curve having a starting value between 0.4 and 10 ohm cm and where the resistivity value increases towards the type change point. Finally the invention relates to a method for producing silicon feedstock for producing directionally solidified silicon ingots, thin sheets and ribbons for the production of silicon wafers for PV solar cells.



Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

— *with international search report*